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(54) **Flowable dried aromatic plant product and process for making same**

(57) Dried herbs and other dried aromatic plant products are prepared by stabilizing them in the freshly harvested state (or, if frozen products are used, during or immediately upon thawing), and then drying them in the presence of a carrier, such as salts, proteins and carbohydrates or mixtures thereof, under mild conditions. The stabilization step consists of either heating to 50°—150°C or mixing with a salt or both.

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SPECIFICATION

Flowable dried aromatic plant product and process for making same

This invention relates to a dried aromatic plant product of the general characterization given in the main claim, a process for producing it, and its use in industrially produced dehydrated food mixtures, in particular dehydrated soup, dehydrated sauce and dehydrated stew mixtures.

One of the factors determining the quality of a food or dish as well as the class of a cook undoubtedly has all along been seasoning in which, apart from salt, sugar and vinegar, herbs and vegetables of a distinctly aromatic flavor (aromatic plants) have always been playing an outstanding role, an additional function assigned to many aromatic plants being that of "decoration".

The fact that the natural keeping properties of most aromatic plants are rather poor and that freshly harvested materials for reasons of climate generally are available regionally and/or seasonally only gave rise to attempts to overcome this deficiency already at an early time.

The various approaches made in this respect may be roughly classified as follows:

1. Supply with freshly harvested aromatic plants improved as plants were grown under glass independently of climatic influences and/or transportation became faster.

2. "Wet preservation" by "stacking", "salting", "potting", "candying" or "freezing".

3. Preservation by converting into "dry products", i.e. "dried aromatic plants" and "essences".

While the first two approaches partly showed remarkably good results, they need not, in the given context, be discussed more in detail, since the aromatic plant products obtained by those methods are commonly agreed to contain more or less high portions of water and so are a priori not suitable for dehydrated food products such as dehydrated soups and sauces which make up a substantial part of industrially produced foods.

As to the third approach, it is noted that, notwithstanding the enormous development of technology in general and of food technology in particular over the last several decades, the situation is practically unchanged from what it was hundreds of years ago and what may be described as follows:

Apart from certain spices of plant origin like cloves, nutmeg, saffron or pepper which are used almost exclusively in dried form at least in mid-Europe, there are very few aromatic herbs like, for instance, bay leaf which are even improved by drying, some aromatic herbs like savory to which traditional drying causes no or at most a minor loss in quality, at least as far as flavor is concerned, and quite a number of aromatic herbs like chives, dill basil, lovage and especially parsley which when dried according to commonly known methods yield a product which, as far as flavor and color go, must be described, strictly speaking, as no more than aromatic "hay" and which, in truth, owes its use in dehydrated foods and in home cooking merely to the fact that good European cooking is unthinkable without these herbs. In this respect even the costly and complicated method of freeze-drying is no major improvement.

Another point is that the dried aromatic plant products obtained by the commonly known methods invariably show unsatisfactory mechanical properties, i.e. under the impact of the shearing forces unavoidable during the manufacture, packaging and handling of dehydrated foods they crumble at least partially into an unsightly powder.

Another not fully satisfactory approach comprised the use of essences which, apart from their natural lack of eye appeal, as a rule show a flavor spectrum which, according to experience, is more or less distinctly changed from the original and in most cases is more one-sided, too.

It is the object of this invention, therefore, to provide dried aromatic plant products of the above-mentioned kind which avoid the disadvantages of the state of the art and are, in particular, flowable as well as shear- and storage-stable and which are readily reconstitutable in aqueous liquids to form aromatic plants which, in terms of flavor and color, are similar at least to a large extent to fresh comminuted aromatic plants.

This object is accomplished according to this invention by the dried aromatic plant products characterized in the main claim on the basis of the finding that aromatic plants, optionally in the comminuted state, when dried in the presence of a water-soluble carrier as described in the claims, which has been uniformly mixed with said plants, yield a dried aromatic plant product showing not only fully satisfactory mechanical properties, i.e. in particular sufficient shear stability, but when used in the preparation of dishes from dehydrated food mixtures seasoned with it is readily reconstituted in aqueous liquids into particles of aromatic plants which, in terms of flavor and color, come fairly close to and sometimes even match freshly harvested comminuted aromatic plants even after prolonged storage.

The advantages of the invention are noted especially with aromatic plants which up to now have been notorious for their poor drying properties, such as, in particular, leek, fennen, red and green peppers, celery leafstalks and sweet majoram as well as, notably, thyme, chervil, cress, chives, dill, lovage, basil, tarragon and parsley.

If an electrolyte, preferably potassium and more preferably sodium chloride, is used as a carrier and if the drying process is conducted in a way that the aqueous liquid present and/or forming in the mixture is more or less constantly saturated with the electrolyt thus showing a distinctly reduced AW-value of at most 0.9, preferably not more than 0.85 and more preferably less than 0.8, it suffices to mix the carrier as uniformly as possible with the aromatic plants within the times stipulated in the main claim and to then dry the mixture in any of the manners commonly known.

In this respect it is noted that what matters alone is to add the electrolyte at the right time whereas the subsequent drying process by no means has to be started, let alone terminated, within the maximum periods specified. It goes without saying, however, that the start of the drying process should not be unnecessarily delayed; as a rule, drying should be terminated after at most 24 hours.

In this particular embodiment of the invention the electrolyte addition, especially if intended to be the sole means of achieving adequate stabilization, is relatively high corresponding to about 25 to 300 w/w %, based on plant dry matter; so, depending upon the purpose for or the manner in which the dried aromatic plant product is ultimately used, it may sometimes be considered annoying. In a case like that it is possible to keep the salt content of the product within certain limits by replacing part of the electrolyte by sugars which may optionally be hydrogenated. Besides, such mixtures of salt and sugars when used in connection with vacuum drying as preferred by this invention because the procedure is simple, show a particularly favorable behavior and, according to latest experience, yield particularly favorable drying results also in terms of flavor preservation.

Optionally, the salt content of the dried aromatic plant products of this invention may be kept low or may even be eliminated altogether by replacing the electrolyte carrier wholly or partially by protein(s) and/or optionally hydrogenated oligo- and/or polysaccharides, preferably soluble, optionally hydrogenated maltopolysaccharides, more preferably maltodextrins, pregelatinized starch and/or so-called soluble or thin-boiling starch. In this case care should be taken, as already pointed out, to ensure that where the electrolyte addition is very small or even missing altogether, a thermal treatment according to Criterion c_2) of the main claim is carried out to stabilize flavor and color.

In this thermal treatment, fast and uniform heating is achieved preferably by mixing the carbohydrate, protein and/or caseinate carrier with very little water and to mix the resulting viscous liquid with the aromatic plant particles which will be uniformly encapsulated in the process. By this method it is possible to obtain not only a shear-stable dried product which, probably due to an "encapsulating effect", also shows a high degree of storage stability, but also a particularly exact, uniform and precisely functioning temperature control during the heat treatment as the carrier-bearing viscous liquid present in the mixture ensures a smooth and fast transportation of the heat.

Carriers which have proved to be particularly suitable for this embodiment of the invention are optionally hydrogenated maltopolysaccharides like maltodextrin and pregelatinized starch as well as, in particular, so-called soluble, liquefied or thin-boiling starches.

It has also been found of advantage to buffer the mixture to be dried by adding alkaline and/or alkaline earth salt(s) of inorganic and/or organic acids, in particular monosodium glutamate, sodium citrate, a lactate, carbonate and/or phosphate, and/or a protein, in particular albumin, and/or a caseinate in a way ensuring that the pH of the cell liquor of the aromatic plant(s), which normally keeps within a natural range of from about 4 to 5 and in the process of drying tends to go down further, is raised so as to range from 4.5 to 7.5, preferably from 5.0 to 7.0 and more preferably from 5.4 to 6.7 and maintained within this range during the drying process. This provides for an even better stabilization with regard to flavor and, in particular, color.

A substance that has proved to be particularly advantageous for this purpose is sodium glutamate which also unfolds in the finished dried aromatic plant products its per se known taste-intensifying activities.

It is noted here that some of the starting materials described above as being suitable for use in the invention may have several functions at the same time. Most of the above-mentioned buffers, for instance, are also carriers.

On the other hand, it is possible to have one and the same function-like, for instance, that of a carrier, fulfilled by several substances at the same time. It is actually recommendable as a rule to work with such mixtures.

This is exemplified by the following batch mixtures which have proved to be excellently suitable in the embodiment involving electrolyte carriers (parts by weight):

fresh herb	salt	sugar	MSG
60	30	5	5
50	15	30	5

In other carriers like, in particular, so called "soluble starch" (e.g. SNOWFLAKE® 6598, a product of Maizena GmbH) the advantages of carrier mixtures are not so apparent but here, too, it is preferable to add small amounts of salt and MSG to the mixture that is to be dried.

As far as drying itself is concerned, it is possible, in principle, to apply any of the common drying processes for the purposes of this invention, but vacuum drying has been found to yield the best results so far.

With this type of drying it is recommended to maintain a layer thickness of drying material of about 20 to 30 mm and to dry it at a temperature of at most 60°C down to a residual moisture of 2 to 3%, it being of advantage to cut off the energy supply during the last third of the drying period thereby allowing the material to gradually cool down to about 40°C.

Vacuum drying produces mostly solid blocks which are, however, easy to comminute.

The following examples will illustrate the practice of the invention. In all of the examples

wherein fresh aromatic plant products were used, the stabilization step (i.e. heating or combining with the electrolyte) took place within 5 to 10 hours of harvesting. The products resulting from the examples were all characterised by excellent flavors and colors, and were virtually indistinguishable from fresh products.

EXAMPLE 1

Fresh red bell pepper (600 g deseeded) was blanched in water at 90°—95°C and subsequently mixed with 300 g of a commercially available protein ("Seralbin") containing 65% by weight whey protein and 20% lactose in a laboratory cutter and comminuted for 2—3 minutes. The mixture was then vacuum dried in a layer of 2—3 cm. The temperature of the heating plate was 60°C, the pressure was about 7 mm Hg, and the drying time was about 6 hours.

The dried product obtained was then grated to the desired particle size.

EXAMPLE 2

600 g of fresh deseeded red bell pepper were blanched in water at 90°C and subsequently mixed with 300 g of sodium caseinate. The mixture obtained was then filled in trays and treated as in Example 1.

EXAMPLE 3

Fresh parsley leaves were blanched for 1 minute in a boiling solution of 100 parts by weight sucrose in 100 parts water. After draining off the excess liquid, the blanched parsley was dried as in Example 1. The dry product contained about 15—20% by weight parsley dry substance.

EXAMPLE 4

100 kg of commercially available deep-frozen basil was tempered for 1 day at −10°C. Sodium chloride (32 kg), monosodium glutamate (9 kg) and sucrose (9 kg) were mixed in a cutter for 30 seconds. Then 50 kg of the basil were added and mixing was continued for 30 seconds, after which the remaining 50 kg basil was added and again mixed for 30—40 seconds.

The basil thawed during the mixing. The mixture, in portions of 5 kg each, was spread onto plastic trays in layers of 3 cm depth. The product was vacuum dried, the temperature of the heating plates being 60°C, over a period of 15—17 hours. During the first stage of the drying the pressure was about 20 mm Hg, which pressure was brought to 7—10 mm during the last stage of the drying. The resulting dehydrated herb mix, which contained about 2—3% moisture, was in the form of cakes, which cakes were broken to the desired particle size in a Frewitt strainer. The yield was about 39—40%.

EXAMPLE 5

Fresh leaves of lovage (100 g) were raised with fresh water and drained. 1200 g sodium chloride were placed in a laboratory cutter, and while the cutter was running on low speed, the washed lovage leaves were added and the mixture was mixed for about 3 minutes. The mix was spread ont a plastic tray in a layer of 2 cm depth and dried under vacuum, the pressure being 10 mm Hg and the temperature of the heating plate being about 65°C, for 7 hours. The yield was 77%.

EXAMPLE 6

200 g sodium chloride and 50 g sodium caseinate were premixed in a laboratory cutter. While the cutter was still running, 600 g of fresh parsley leaves (which had been washed and drained) were added to the cutter and the material was mixed for 2—3 minutes. The mix was then dried as in Example 1, the drying time being 5 hours. The yield was 35—36%.

CLAIMS

1. A flowable dried aromatic plant product comprising dried comminuted aromatic herbs and/or vegetables (aromatic plants), characterized in that it

a) contains 10 to 99 w/w% referred to total dry matter of at least one edible, water-soluble carrier selected from the group consisting of

a_1) alkaline and alkaline earth salts of inorganic and organic acids (electrolyte),

a_2) proteins

and

a_3) carbohydrates, optionally hydrogenated, and

b) has been obtained by drying optionally communited aromatic plants, which have been freshly harvested and/or deep-frozen in the freshly harvested state, in the presence of the carrier which has been uniformly mixed with it, at temperatures not exceeding 70°C in the product,

c) on the understanding that said aromatic plants have been stabilized either prior to or at the beginning of drying, i.e. no more than 12 hours after harvesting and no more than 4 hours after comminuted in the case of freshly harvested aromatic plants, or no later than immediately upon thawing in the case of aromatic plants which were deep-frozen in the freshly harvested state, by

c_1) mixing with at least one electrolyte and/or

c_2) heating rapidly to 50—150°C for 2 seconds up to 1 hour as well as, optionally, immediate fast cooling to 70°C or less.

2. The dried aromatic plant product of claim 1, characterized in that it contains from 25—97 w/w% and most preferably from 50—94 w/w%, of the carrier.

3. The dried aromatic plant product of claim 1 or claim 2, characterized in that it contains as aromatic plant(s) basil, parsley, lovage, dill, chives, chervil, sweet majoram, thyme, celery, paprika, fennel and/or leek.

4. The dried aromatic plant product of any one of claims 1 to 3, characterized in that the carrier consists at least in part of sodium and/or potassium chloride in an amount of 25 to 300 w/w%, based on plant dry matter.

5. The dried aromatic plant pr duct of any one of claims 1 to 4, characterized in that the carrier consists at least in part of at least one soluble, optionally hydrogenated maltopolysaccharide, in particular maltodextrin, soluble or thin-boiling starch and/or pregelatinized starch.

6. The dried aromatic plant product of any one of claims 1 to 5, characterized in that it is buffered with at least one alkaline and/or alkaline earth salt of an inorganic or organic acid, in particular monosodium glutamate, sodium citrate, a lactate, carbonate and/or phosphate and/or a protein, in particular albumin and/or a caseinate, to a pH of 4.5 to 7.5, preferably 5.0 to 7.0 and more preferably 5.4 to 6.7.

7. A process for producing shear-resistant, colour- and flavour-stable, flowable dried aromatic plant products as in any one of claims 1 to 6, by drying optionally comminuted aromatic plants at temperatures not exceeding 70°C in the material, characterized in that aromatic plants which have been freshly harvested and/or deep-frozen in the freshly harvested state and prepared and, optionally, comminuted in the manner known are mixed,

a) when using freshly harvested aromatic plants; at most 12 and preferably not more than 6 hours after harvesting, and optionally at most 4 and preferably not more than 2 hours after comminuting

or,

when using deep-frozen aromatic plants, not later than immediately upon thawing with at least one lectrolyte carrier

and/or

heated as fast as possible to a temperature of 50 to 150°C, kept at this temperature for 5 seconds to 1 hour and then optionally re-cooled fast to 70°C or less subject to the proviso that this heat treatment is carried out whenever the electrolyte addition is less than required to guarantee that the water activity (AW-value) in the free liquid, which is present forms in the mixture, is below 0.9, preferably below 0.85 and more preferably below 0.8,

b) that said aromatic plants are then dried in the presence of the carrier which has been mixed with them as uniformly as possible, at temperatures not exceeding 70°C in the material

and

c) optionally comminuted to the desired particle size.

8. The process of claim 7 characterized in that the aromatic plants before drying are buffered by mixing with at least one alkaline and/or alkaline earth salt of an inorganic or organic acid, in particular monosodium glutamate, sodium citrate, a lactate, carbonate, acetate and/or phosphate, and/or a protein, in particular albumin and/or a caseinate, to a pH-value in the range of 4.5 to 7.5, preferably 5.0 to 7.0 and more preferably 5.4 to 6.7.

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